Chapter IV. Agriculture.

COTTON.

In 1882-83, the area under American cotton further rose to 145,397, and the area under local cotton fell to 375,070 acres.

The following table gives the areas under American and local cotton during the forty-one years ending 1882-83:

Dhárwár Cotton Area, 1842-1883.[1]

YEAR.	American.	Local.	Total.	YEAR.	American.	Local.	Total.
	Acres.	Acres.	Acres.		Acres.	Acres.	Acres.
1842-43 ...	27	184,237	184,264	1863-64 ...	323,535	203,626	527,161
1843-44 ...	545	178,411	178,956	1864-65 ...	280,230	185,374	465,604
1844-45 ...	2749	182,437	185,186	1865-66 ...	261,943	160,046	421,989
1845-46 ...	11,176	164,591	175,767	1866-67 ...	304,688	161,750	466,438
1846-47 ...	22,331	167,592	189,833	1867-68 ...	300,399	181,485	481,884
1847-48 ...	20,502	179,229	199,731	1868-69 ...	317,310	194,586	511,896
1848-49 ...	3351	201,578	204,929	1869-70 ...	425,099	222,116	647,215
1849-50 ...	15,578	225,685	241,258	1870-71 ...	336,297	195,304	530,601
1850-51 ...	31,668	223,315	254,983	1871-72 ...	315,387	203,191	518,578
1851-52 ...	42,647	221,676	264,323	1872-73 ...	195,809	318,448	514,257
1852-53 ...	28,010	251,114	279,424	1873-74 ...	215,325	268,169	483,494
1853-54 ..	41,403	252,006	293,409	1874-75 ...	234,341	221,343	455,684
1854-55 ...	63,298	210,260	273,559	1875-76 ...	336,235	232,630	568,865
1855-56 ...	66,514	202,843	269,357	1876-77 ...	44,024	99,830	143,854
1856-57 ...	108,207	196,931	305,138	1877-78 ...	128,277	277,300	405,577
1857-58 ...	130,880	252,850	383,730	1878-79 ...	246,210	233,280	479,490
1858-59 ...	124,752	214,993	339,745	1879-80 ...	141,726	331,465	473,191
1859-60 ...	191,281	230,665	421,946	1880-81 ...	77,121	439,251	516,372
1860-61 ...	191,026	234,452	425,478	1881-82 ...	138,790	395,396	534,186
1861-62 ...	214,310	200,491	414,801	1882-83 ...	145,397	375,070	520,467
1862-63 ...	363,174	207,063	570,237				

GARDENS.

GARDENS are found chiefly in Bankápur, Hángal, Karajgi, Kod, and Ránebennur where irrigation is abundant and easy. The best gardens are below the large reservoirs. They are fenced with guava, lime, and other fruit trees, and contain sugarcane, cocoa and betel palms, and betel vine. During the greater part of most years the gardens draw a plentiful supply of water from the reservoir. The supply is also helped by the soaking of water through the pond bottom into the gardens. To help this soaking holes are dug a few feet deep, and, if the reservoir fails, the water is scooped out of the holes by shallow baskets called *gudás* which are swung through the well and carry a basket full of water to a level high enough to let it run into all the small channels. Minor garden crops and watered dry crops as well as rice are often grown in the gardens as change crops after sugarcane or after the betel vine is removed, to give the soil fresh vigour. Some gardens with a poor water-supply grow only minor crops. Except in parts of Kod the better garden crops are grown with much care and labour. In the slovenly gardens of Kod, in one corner betel vines are mixed with a plantation of young betel palms. Between the rows of betel vines and perhaps in other parts of the garden are a few plantain trees, and, scattered about with little regard to regular planting are thirty to sixty cocoa palms. The rest of the garden is altogether untilled, or is perhaps sown with crops which would grow nearly as well in a field as in a garden, but which have the merit of hardiness and of requiring little care. The chief garden crops are the betel vine, plantain, betel palm, cocoa palm, and mulberry.

[1] The figures are for the district of Dhárwár including alienated lands in Government villages and native state lands mixed with Government lands.

GARDENS.

Betel Vine.

The Betel Vine *elebulle* (K.) or *pán* (M.) Piper betel, a perennial, is the chief garden produce. It is planted by cuttings. As it is a creeper, long thin quick-growing trees generally *nagis, halivals,* and *chavgachis* are set close beside it for the vine to train on. The vine wants manure three or four times during the year, and, to succeed well, must be watered every eighth day and still oftener during the first year. The vine begins to bear leaves in the third year and yields a crop every third month. An acre of land contains upwards of two thousand plants. Leaves are gathered for four, five, six, and sometimes seven years when the vines die and are dug up, the leaves of the trees on which they have been trained affording vegetable manure to young plantains and their wood being used for fuel. After a crop of betel vine the garden is deeply dug all over. According to some accounts it lies fallow for a whole year and is then planted with sugarcane; after the sugarcane it enjoys another year of fallow, when the betel vine is again planted or instead of it plantains. According to others sugarcane is planted immediately after the ground has been cleared of the betel vine and has been well dug, ploughed, and levelled; then one year of fallow succeeds the cane, and the fallow is followed by plantains or betel vine, or, before these, by a crop of chillies or a dry-crop. Most of the betel leaves are used in the district, the rest are sent to Belgaum. Except to men of means the betel vine is not a paying crop as the heavy expense of two years of planting, manuring and watering has to be met before there is any return.

Plantains.

Plantains *bálegidu* (K.) or *kel* (M.) Musa sapientum yield only one crop. The trees are then cut down, but new shoots spring from the roots which are transplanted and set in a small pit with manure earth and dry leaves and well watered every eighth day. They are planted in lines four to five feet apart, bear fruit in the second year, and are then cut down. In some cases plantains are followed by a year's rest and the year's rest by betel-vine.

Betel Palms.

Betel Palms[1] *adkigidu* (K.) or *supári* (M.) Areca catechu are generally scattered among the betel vines. When planted by themselves, an acre of land holds over six hundred palms. The palm appears above ground six months after the nut has been planted. If cared for and freely watered, at first twice and afterwards once a month, the betel palm bears fruit in eight years; otherwise it does not begin to bear for ten or even twelve years. It continues to bear yearly for fifty to seventy-five years. The nuts are taken from the tree between October and December.

Cocoa Palms.

Cocoa Palms *tenguigidu* (K.) *náriel* (M.) Cocos nucifera bear when ten to twenty years old. If manured and watered, at first twice and afterwards once a month, they generally bear in their twelfth year and continue bearing nearly a hundred years.

Mulberry.

The Mulberry *hila* (K.) *tut* (M.) Morus indica is found in many native gardens grown sometimes as a hedge plant and sometimes for their small and pleasant fruit. They seem to have been introduced

[1] Fuller details are given in the Kánara Statistical Account, Bombay Gazetteer, XV. Part II. 7-9.

Chapter IV. Agriculture.

GARDENS. *Mulberry.*

some sixty years ago when the first attempt was made to grow silk.[1] In 1823 Mr. Baber the Collector introduced worms from Maisur into the Bombay Karnátak, first at the Dhárwár jail, and afterwards among a few Musalmáns near Dhárwár, Hubli, and other towns. These persons were granted seven years' leases and were given advances of cash. The attempt to grow silk was so far successful that in 1827 a package of Dhárwár silk was sent to England. The ship which carried it was wrecked and the sample damaged. The Court of Directors reported that had the parcel been in a sound state the raw silk would have been sold at the rate of twelve shillings a pound. In 1833 Dr. Lush, who at that time was in charge of the Dhárwár cotton experiments, reported that the people among whom the worms were distributed had each one or two acres of land under the mulberry. The outturn was a few *mans* of silk for local use which in the Hubli market sold at 14*s.* to 16*s.* the pound (Rs. 3½-4 the *ser*). In 1842 about four hundred pounds of a very inferior silk was made. In 1843 at Dhárwár there were 200 mulberry trees and 25,000 bushes, besides 10,820 bushes in the jail garden. About 272 pounds of silk worth £50 (Rs. 500) were made by the people and 144 pounds worth £36 (Rs. 360) were made by the prisoners. In 1848 after inquiry the attempts to grow the mulberry with a view of establishing a silk industry were stopped. In 1865 silk experiments were revived at Dhárwár by Dr. Mackenzie the jail superintendent. In the sixteen months ending September 1869 the jail produced nearly eleven pounds of raw silk worth about 16*s.* (Rs. 8) a pound. A comparison of the results of the last six with the first ten months of the period showed marked improvement in the weight of the cocoons and an advance from 6·7 to 8·7 in the proportion of silk to total weight. Dr. Mackenzie thought the improvement was due to the greater attention which had been paid to the food of the worms, to regularity in feeding them, to the airiness and brightness of their rooms, and to the efforts made to prevent the temperature varying more than from 85° to 90°. The worms were fed on mulberry bushes cut down at the beginning of each monsoon and not allowed to grow more than three or four feet high. The worm bred has not been identified. From Dr. Mackenzie's description it seems to have been one of the Bengal multivoltines; its total course is given at 55½ days. In 1872 besides the jail experiment there was a small mulberry plantation which turned out a fair supply of cocoons. During 1873-74 the mulberry plants throve well without watering, and though not a drop of rain fell from the 8th of November 1873 to the beginning of April 1874, the bushes continued without watering fresh and healthy and threw out a constant supply of leaves enough to feed a considerable number of silk worms. In 1873 samples of raw silk, the result of Dr. Mackenzie's trial, were sent to experts in Glasgow, London, and France. Their opinions and suggestions were closely alike. The thread was bright in colour and had good nerve; it had been much spoiled by bad reeling. The

[1] Silk in India by Mr. J. Geoghegan, Under Secretary to the Government of India (1872), 27-41.

highest value of the sample was 12*s.* (Rs. 6) the pound; had it been properly reeled it would have been worth £1 4*s.* to £1 5*s.* (Rs. 12-12½) the pound. The experts considered that the sample showed that Bombay was in a better position for growing silk than Calcutta. In April 1874, Dr. Mackenzie, while noticing these favourable opinions, wrote to the Bombay Government that successful silk growing in Dhárwár would depend entirely on European supervision, and that he found on inquiry that, even at the highest rates fixed by the European experts, there would always be a demand in the Bombay Presidency, in Bángalur, and elsewhere for such silk without the trouble and expense of sending the produce to Europe. The Bombay Government considered that the climate and soil of Dhárwár were well suited for silk growing and that Dr. Mackenzie's experiments gave a fair hope of success. They directed him to continue his operations with jail labour and to plant a plot outside the jail with mulberry, and granted him £50 (Rs. 500) for sundry expenses connected with the trial.[1] In 1876 experiments were made to rear the tasar silk-worm, but owing to the small amount of silk cocoons obtained no important result was noted. Cotton has for the most part driven out silk, and, in Mr. Robertson's opinion, water is too far below the surface for irrigated mulberry tillage to pay.

In May 1873 Mr. E. P. Robertson, C.S., then Collector of Dhárwár, asked the sanction of Government to start an experimental farm near the villages of Navalur and Lakhmanhalli about five miles south of Dhárwár. The farm was to be started on about seventy-seven acres and to be gradually extended to two hundred acres. Government gave their sanction and Mr. Shearer who since 1866 had conducted the cotton experiments in Dhárwár was appointed its superintendent. The land was obtained with some difficulty, and late in the season Mr. Shearer began work in 29½ acres of land divided into seven plots. The land was broken with a plough and grubber that had been sent out by the late Marquis of Tweeddale through the Secretary of State. This machine was based on the wheel and lever principle. It had been planned by and made under the supervision of the late Marquis of Tweeddale when Governor of Madras (1842-1848). It was worked with one or two pairs of bullocks and though as light to work for the same depth as the country plough it had several advantages. When once set on a straight furrow it needed no holding. It turned out a furrow each time while the country plough merely displaces the soil on each side and generally leaves a ridge altogether unploughed; it could be used in soil moderately dry and could be regulated to depth and breadth to suit the bullock's strength, while the country plough cannot be worked in a too moist and heavy soil. The English plough fell into disuse because its repair required more skilled labour than the ordinary field tools. During the season the farm was increased to 103 acres. The cotton crop was a success, the acre yield varying from sixteen to seventy-five pounds of clean American, and from seventy to 154 pounds of clean local cotton. Want of rain

EXPERIMENTAL FARM.

[1] Memorandum on Silk in India by L. Liotard, Department of Revenue and Agriculture, Government of India, 1883.